Biotechnology Notes

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Biotechnology Notes, *a compilation of agency activities, news events, and upcoming meetings, is prepared for members of the U.S. Department of Agriculture's (USDA) Committee on Biotechnology in Agriculture (CBA) by USDA's Office of Agricultural Biotechnology (OAB).*

INSIDE USDA

I'LL TAKE A DOZEN *AQUA* ROSES, PLEASE

Researchers at USDA's National Arboretum/Agricultural Research Service, have solved the mystery of how color genes work. As a result, "It will be possible to create an infinite range of custom-colored flowers using genetic engineering once the biochemistry of flower color is known for a specific plant," said pigment expert Robert Griesbach, who has been working for 15 years on putting together the many pieces of the plant color puzzle.

Simply stated, flower color is influenced by the interaction of flavonoids, or plant pigments, the cellular environment (pH), light, and temperature. The slightest fluctuation in any of these factors will have an effect on color. Griesbach used petunias for his research in proving that specific shades of color can be explained by the combined inheritance of plant pigments and cell acidity or pH. For more information, please call Robert Griesbach at 301-504-6574.

AQUATIC RESEARCH STANDARDS OFF PRESS

After 7 years of discussion, four working group meetings of USDA's Agricultural Biotechnology Research Advisory Committee (ABRAC), three international workshops, and numerous informal meetings, the *Performance Standards for Safely Conducting Research With Genetically Modified Fish and Shellfish* and its companion document, *Flow Charts and Accompanying Worksheets*, have now been published and are available free-of-charge from USDA's Office of Agricultural Biotechnology (OAB).

The Standards were prepared by USDA's ABRAC and its Working Group on Aquatic Biotechnology and Environmental Safety with advice from more than 200 interested individuals from the aquatic research community, environmental interest groups, the aquaculture industry, and State and Federal fisheries management agencies. The Standards are voluntary and intended to aid scientists in assessing the environmental safety of research using genetically modified fish, crustaceans, or mollusks. If there is a need, the Standards can help researchers develop risk management measures so their

project can be conducted without adverse effects on the environment. To receive a copy of the Standards, please send a request by fax to 202-720-5336, or an E-mail message to mmerritt@reeusda.gov. For further information, please call 202-720-5853.

NEWS OF INTEREST TO ANYONE WHO PASSED CHEMISTRY 101, DIDN'T BLOW UP THE LAB, OR SINGE THEIR PARTNER'S HAIR

Money available on a competitive basis is now available from the National Research Initiative (NRI) Competitive Grants Program, which is managed by USDA's Cooperative State Research, Education, and Extension Service (CSREES). The research categories of particular interest to CSREES include: natural resources and the environment; nutrition, food safety, and health; animals; pest biology, biological control, and integrated pest management; plants; markets, trade, and rural development; value-added products; and ag systems research. Each category is further broken down into more specific fields of study. Innovative proposals deemed "high-risk" are encouraged as well as proposals with more immediate application. It is suggested that applicants contact the appropriate NRI program director before preparing a proposal.

There are several ways to receive copies of the solicitation and an application kit. One may send a request in writing to NRICGP, c/o Proposal Services Branch, OEP/CSREES/USDA, AG Box 2245, Washington, DC 20250-2245; or telephone 202-401-5048; or send a request via Internet (include your "real" mailing address and phone number) to psb@reeusda.gov; or browse the Web at http://www.reeusda.gov. Deadlines vary according to program area. Good luck, applicants!

BRIDGING THE COMMUNICATION GAP

The just released April-June issue of *Probe*, a newsletter for USDA's Plant Genome Research Program, delves into the obstacles faced by scientists in communicating science with the public-at-large. The authors first note that the problem stems from both the population's low scientific literacy as well as the scientific community's propensity to use technical jargon. One solution offered is for scientists to translate their language into concepts and analogies that can be easily understood by lay audiences. For example, compare DNA to a videotape that can be decoded, expressed, copied, spliced, and edited. Reach out to school groups or civic associations and practice communicating science simply, urge the authors. The article also includes several guides that list organizations that can provide assistance, lesson plans, lab exercises, videos, and listserves. The article was prepared by Ray Dobert, Coordinator at USDA's Biotechnology Information Center, and Tom Zinnen, Extension Specialist at the University of Wisconsin's Biotechnology Center. To receive a copy of this issue of *Probe*, please call Susan McCarthy, Managing Editor, at 301-504-6613; Fax: 301-504-7098; E-mail: smccarth@nalusda.gov

NEWS AROUND THE NATION (AND THE WORLD)

RESEARCH WITH AN ACCENT: OECD'S FELLOWSHIP PROGRAM

The Organization for Economic Cooperation and Development (OECD) is accepting applications from scientists willing to carry out research abroad in a number of areas, including: ecology of new organisms, insect and weed control with new organisms, population biology, biodiversity, sustainability, and mathematical modeling.

The deadline for submitting applications is November 24, 1995. Awards will be made in January 1996, and travel must be taken between February 15 and November 30, 1996. The fellowships are from 2 to 26 weeks in duration. The grant includes traveling expenses of the fellow only and a fixed allowance. To receive an application, either call Jim Lawrence at USDA at 301-504-5605; Fax: 301-504-5298; or write to him at USDA, ARS International Research Programs, Room 102, Bldg. 005, BARC-W, Beltsville, MD 20705.

A POST-HALLOWEEN BONUS: WITCHES ON BROOMS SWEPT AWAY

That's the word from scientists in Israel who have successfully incorporated an herbicide-resistant gene into plants to help control two parasitic weeds, *broom*rape and *witch*weed. The weeds attach themselves to the roots and absorb a plant's nutrients. Vegetables, legumes, and sunflower crops in the Mediterranean region are especially vulnerable to broomrape, while witchweed attacks grains growing in sub-Saharan Africa.

Tobacco and oilseed rape were the two model plants selected by researchers Daniel Joel and colleagues and Jonathan Gressel. After modifying the tobacco plants to resist the herbicide chlorsulfuron, the plants grew and flowered normally while the broomrape was fully controlled. Another herbicide, glyphosate, was applied to genetically engineered oilseed rape plants. A single application prevented broomrape infestation but caused no damage to the transgenic oilseed rape plants.

To learn more about the study, which was conducted as part of a project supported by the Agency for International Development Trilateral Egypt-USA-Israel Program, please call Daniel Joel at 972-4-983-3186; Fax: 972-4-983-6936.

CONSUMER REPORT RATES BIOTECH TOMATOES

The July 1995 issue of *Consumer Report* magazine discussed two reviews of genetically engineered tomatoes, one conducted during winter months, one in the summer. The reviewers compared the MacGregor tomato, which is grown from Calgene's Flavr Savr

seed, with supermarket varieties, those purchased at farmstands, and others imported from Holland and Israel. The investigators were looking at flavor, juiciness, and texture. In general, the testers felt the biotech tomato was not as tasty as those tomatoes purchased at farmstands, but better than the supermarket or imported varieties. The reviewers also found the biotech tomato to be generally more expensive.

SAVING LIVES WITH TRANSGENIC TOBACCO

Gaucher's (go-shay's) disease is a rare genetic disorder named after French physician Philippe Charles Ernest Gaucher. Symptoms include liver and spleen enlargement, anemia, reduced platelets, and impaired brain and growth development. These symptoms result from the accumulation of a fatty substance, or lipid, called glucocerebroside. Gaucher patients do not have the normal, human enzyme called glucocerebrosidase, which is needed to break down the lipids.

The most effective treatment is a drug made from human placentas. Between two thousand and eight thousand placentas are needed to produce one dose of the drug, which must be administered every two weeks. Lack of quantity of the drug makes treatment very costly. For example, it could cost as much as $300,000 to treat one patient for 1 year. Now, research using genetic engineering has the potential to lower the costs by manufacturing human enzymes in crop plants and thus make some drugs more affordable.

Researchers at CropTech Development Corp. in Blacksburg, VA genetically engineered the tobacco plant to express the human gene that codes for the needed enzyme for Gaucher's disease. The gene has been stably expressed in the tobacco plant, including its leaves and seeds. But several more years of research is needed before the drug will be ready for human trials, said scientist Carole Cramer, who delivered a paper on this project at the International Symposium on Genetically Engineering Plants for Commercial Products and Applications, October 3, in Lexington, KY. To learn more about the research, please write to Carole Cramer, CropTech Development Corp., 1861 Pratt Dr., Blacksburg, VA 24060; or call the National Gaucher Foundation at 1-800-925-8885.

IT'S A WRAP FOR NCR-150

At the annual meeting of the North Central Agricultural Experiment Station Directors, it was voted unanimously to terminate NCR-150 and forgo annual meetings in 1996 and 1997 because the committee had fulfilled its primary goal of promoting animal biotechnology. The committee provided leadership in identifying areas of national need for animal research and provided biannual forums for information exchange between scientists, federal agencies, and commodity groups regarding the use of biotechnology in animal research. As a result there has been widespread adoption of cellular and

molecular biology approaches across all disciplines of animal agriculture. For more details, please call Bill Baumgardt at Purdue University at 317-494-8362; Fax: 317-494-0808.

U.K. APPROVES BIOTECH FOODS FOR SALE

By the end of 1995, British consumers will be able to purchase three bioengineered products: tomato paste containing genetically modified tomatoes, an oil derived from modified oilseed rape, and processed products from a modified soybean. All the products were cleared on safety grounds by the British Ministry of Agriculture and authorized for commercial sale by the Advisory Committee on Novel Foods and Processes, an independent body of experts responsible for ensuring there is no risk to consumers from chemical or genetic changes in food.

ALL ABOUT AGBIOTECH: NEW BOOKLET SERIES PREMIERS

What is biotechnology and how is it used in agriculture? How do consumers and farmers benefit from biotechnology? Are there risks as well as benefits? These are a few of the many topics covered in a new, easy-to-read booklet series prepared by Ag-West Biotech Inc. and the Canadian Institute of Biotechnology.

The first two booklets are entitled "Biotechnology, Agriculture and Your Food: An Introduction to the Benefits of Biotechnology in Agriculture" and "From Field to Plate: A Discussion of the Issues Surrounding Biotechnology in Agriculture." They are published by Westcross House Publications, Saskatoon, Saskatchewan, Canada. To place an order, please write to Ag-West Biotech Inc., 230-111 Research Dr., Saskatoon, Saskatchewan, S7N 3R2; or call 306-975-1939. A handling charge may apply for multiple copy orders.

NEW WEB ADDRESSES

The Ag Bioethics Forum at Iowa State University:
http://www.public.iastate.edu/~grad_college/bioethics

Weeds World, a newsletter that focuses on *Arabidopsis*:
http://www.nalusda.gov/

IN CASE YOU WEREN'T THERE

■ **"Biotechnology Opportunities in Asia"** was the focus of a lecture sponsored by the Biotechnology Industry Organization, October 10, in Washington, DC. Kathryn Lindquist, president of the InterCommerce Corporation, said there are many reasons for biotech firms to invest in Asia including high rates of return, the technical capabilities of the workforce, manufacturing opportunities, tax incentives, and subsidized facilities. She cautioned, however, that to be successful entrepreneurs must be willing to develop close personal relationships, invest a lot of time, money and patience, and be willing to stay in it for the long term. She said Singapore is an ideal place to locate a biotech firm because of good universities, research facilities, and strong government support for biotechnology. In addition, she said Singapore is able to help fund projects.

■ **In a recent radio interview with USDA, OAB Director Alvin Young** discussed his visit to China as head of a team of aquaculture experts. He said in 1978 China invested heavily in aquaculture research to help feed its more than 1 billion people. The goals of the aquaculture research programs were to produce healthier and more feed-efficient fish and shellfish. By 1991 China had tripled the numbers of its workers in aquaculture to 10 million and was producing 20 million tons of fish. They had also developed the first transgenic fish.

In an effort to bring back information useful to U.S. research, the team visited major aquaculture institutions scattered around the country. Young said funding for research appears to have decreased sharply and many institutions have been left with minimal support. Some of the facilities have fallen into disrepair. Of the 21 marine and aquaculture centers established in 1978, only two are doing significant, state-of-the-art work, said Young. But a recent shuffling of agricultural research priorities may again put aquaculture on top. The goal is to increase fish production from 21 million tons this year to 30 million tons by year 2,000. Young said such a goal would require the Chinese to convert wetlands and reservoirs for aquaculture production. In addition, he said advanced technology would need to be infused into the existing program.

Team members included Anne Kapuscinski, University of Minnesota; Eric Hallerman, Virginia Polytechnic Institute and State University; and David Attaway, National Oceanic and Atmospheric Administration. The trip was arranged and sponsored by USDA's Research and Scientific Exchange Division, Foreign Agricultural Service. A trip report will be available for public distribution.

NEW PUBLICATIONS

■ *Chinese Biotechnology Directory* (English Edition). A guide to biotechnology in the People's Republic of China including an overview of China's R&D, policy, regulatory environment, bio-industry, and information services. To order, write to Han Consultants Inc., P.O. Box 71006, Wuhan Hubei 430071, P.R. China; or call 86-27-783-8532; Fax: 86-27-781-8343.

■ *Investment Opportunities in China: Emphasizing Biotechnology, Drugs, Agriculture, Food and Chemicals*. Published by Business Communications Inc., Norwalk, CT. January 1995. Call 203-853-4266; Fax: 203-853-0348.

■ New booklet series from Ag-West Biotech Inc. For more details, please see article "All About Agbiotech: New Booklet Series Premiers" on page 5.

■ "Managing the Evolution of Insect Resistance to Transgenic Plants," by D. N. Alstad and D. A. Andow in *Science*, Vol. 268, 30 June 1995. Published by the American Association for the Advancement of Science. Also available as a reprint.

■ Minutes of USDA's ABRAC meeting held June 26, 1995. Document No. 95-06. To receive a free copy, please send a request by fax to 202-720-5336.

■ 1994 Annual Report (Oct. 1993-March 1995) of Japan's International Research Center for Agricultural Sciences. To request a copy, please call 0298-38-6330.

UPCOMING MEETINGS

Nov. 9-10: "Biotechnology at 1890 Institutions: A Symposium." Tallahassee, FL. Sponsored by Florida A&M University's College of Engineering Sciences. For details call Mehboob B. Sheikh at 904-561-2219.

Nov. 13-15: Pacific Rim University/Industry Technology Transfer Conference. Los Angeles, CA. Sponsored by Technology Transfer Conferences Inc. For details, please call 615-366-0679; Fax: 615-366-0695.

Nov. 13-18: Biotecnologia Habana '95. Havana, Cuba. For details, please write to Biotecnologia Habana '95, P.O. Box 6162, Havana 10600, Ave. 31 entre 158 y 190, Cubanacan, Cuba; E-mail: biot95@ingen.cigb.edu.cu

Nov. 30-Dec. 1: Exploiting Transgenic Technology for Commercial Development. San Diego, CA. Sponsored by International Business Communications. For more details, please call 508-481-6400.

Dec. 17-22: "Biotechnology of Foods and Flavors." A symposium at the PACIFICHEM '95 Congress. Honolulu, Hawaii. Registration information is in *Chemical Engineering News*, July 10, 1995.

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Jan. 14-18: The International Plant Genome IV Conference. San Diego, CA. For details, please call 212-643-1750; Fax: 212-643-1758; E-mail: Scherago@Biotechnet.Com

Jan. 15-18: BioEast '96. Washington, DC. Sponsored by *Genetic Engineering News* and the International Society for the Advancement of Biotechnology. For details, please send a fax to 301-652-4951.

Jan. 19: Meeting of USDA's Agricultural Biotechnology Research Advisory Committee. Washington, DC. For details, please call 202-720-5853.

Jan. 22-24: "Commercializing Biopesticides: Applied Products and Transgenic Plants." Washington, DC. Sponsored by International Business Communications. For details, please call 508-481-6400 or send a Fax to 508-481-7911.

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